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July 20, 2007

Via Email
Original via Courier

Mr. R.J. Pellatt
Commission Secretary
BC Utilities Commission
Sixth Floor, 900 Howe Street, Box 250
Vancouver, BC V6Z 2N3

Dear Mr. Pellatt:

Re: FortisBC Inc. ("FortisBC") Naramata Substation Project

Please find enclosed for filing twenty copies of FortisBC's response to Information Request No. 2 from Naramations Against Fortis Substation ("NAFS") and Mr. David Andrew. FortisBC considers that some of the questions posed are more appropriately dealt with in hearing and, pursuant to the Commission's letter of June 22, 2007 (Exhibit A-8) will be prepared to respond at that time.

Sincerely,

(original signed by J. Martin)

David Bennett
Vice President Regulatory Affairs
and General Counsel

cc: Registered Intervenors

1 **Q2.2.0 Reference: Exhibit B-5, NAFS A1.4.4; BCUC A2.5.6 (table on p.6)**

2 **Q2.2.1 Please reconcile the figures given in NAFS A1.4.4 with the figures in BCUC**
3 **A2.5.6 (table on p.6). NAFS A1.4.4 shows Arawana Road Site & Line (\$6,289k)**
4 **as higher than Arawana Road (\$6,189k), whereas BCUC A2.5.6 (table on p.6)**
5 **shows Option D as lower than Option C.**

6 A2.2.1 Arawana Road Site and Line referred to in NAFS A1.4.4 is equivalent to Option C in
7 BCUC A2.5.6 and Arawana Road Site referred to in NAFS A1.4.4 is equivalent to
8 Option D in BCUC A2.5.6.

9

10 To further clarify, the Arawana Road Site and Line in NAFS A1.4.4 refers to the
11 option that would have the transmission line constructed along the “direct cross-
12 country” route.

13

14 **2.3.0 Reference: Exhibit B-5, NAFS A1.4.8**

15 **Q2.3.1 Does the note “includes AFUDC incurred to date” apply to “Pre 2006” only, or**
16 **to both “Pre 2006” and “2006 Current Estimate”?**

17 A2.3.1 The notation applies to both. Please also note that “2006 Current Estimate” should
18 read “2006 Actual”.

19

20 **Q2.3.2 It appears that the AFUDC is calculated as 6% of the running total of the “2006**
21 **Current Estimate” (\$1,525k) and the subsequent quarterly capital expenditures.**
22 **Is that correct? If not, please explain.**

23 A2.3.2 The AFUDC rate is 6.0% annually. The pre-2006 expenditures are included in the
24 AFUDC calculation. In 2007, AFUDC is calculated on cumulative capital
25 expenditures including prior years’ AFUDC; however, AFUDC charged in 2007 is
26 not compounded during 2007. In 2008, AFUDC is calculated on cumulative capital
27 expenditures, including AFUDC incurred during 2007 and prior years.

1 **Q2.3.3 What are the capital expenditures of \$21k and \$320k for 1st and 2nd quarter**
 2 **2007 for both Fire Hall and Arawana Road? I.e., on what is the money being**
 3 **spent?**

4 A2.3.3 The costs shown in Q1 and Q2 of 2007 reflect investigative costs (primarily
 5 engineering and site review) related to the project incurred to date in 2007.
 6

7 **Q2.3.4 Please confirm that the capital expenditures on which AFUDC is calculated are**
 8 **less than 10% greater for Fire Hall than for Arawana Road.**

9 A2.3.4 Confirmed

11 **Q2.3.5 Please confirm that the AFUDC for Fire Hall (\$772k) is \$432k greater than the**
 12 **AFUDC for Arawana Road (\$340k).**

13 A2.3.5 Confirmed

15 **Q2.3.6 How much (in \$) of the amount by Fire Hall AFUDC exceeds Arawana Road**
 16 **AFUDC is attributable to the later in-service date of Fire Hall compared to that**
 17 **of Arawana Road?**

18 A2.3.6 The following table re-calculates the AFUDC assuming project completion in Q3
 19 2008. The AFUDC is \$398,000 lower than the actual timeline (\$772,000 - \$374,000).
 20

	2006		2007 Capital Expenditures					2008 Capital Expenditures					2009	TOTAL ALL YEARS
	PRE 2006	Total	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL		
Capital Expenditures	584	1,525	21	320	300	300	941	1,300	1,100	1,050	0	3,450	0	6,500
AFUDC			32	34	39	44	149	58	76	92	0	225	0	374
TOTAL	584	1,525	53	354	339	344	1,090	1,358	1,176	1,142	0	3,675	0	6,874

21
 22
 23 **Q2.3.7 Does the later in-service date of Fire Hall (compared to that of Arawana Road)**
 24 **mean that the entry of the project capital expenditure into FortisBC's rate base**
 25 **is correspondingly delayed?**

26 A2.3.7 Yes.
 27

1 **Q2.3.9 Why was the AFUDC calculation for the Fire Hall site reduced by \$140,000 in**
2 **the IR response?**

3 A2.3.9 The initial calculation contained an error that double-counted a portion of the
4 AFUDC in the period up to 2006.

5
6 **2.4.0 Reference: Exhibit B-5, NAFS A1.4.5**

7 **Q2.4.1 Please confirm that based on the figures presented in NAFS A1.54.4 the**
8 **difference in one-time equivalent rate impacts between the Arawana Road**
9 **substation site (whether via Arawana Road or ‘direct’) and the Fire Hall**
10 **substation site is the difference between 0.16% and 0.17%.**

11 A2.4.1 Confirmed.

12
13 **2.5.0 Reference: Exhibit B-5, NAFS A1.4.9; NAFS Appendix A1.20.2**

14 **Q2.5.1 Please provide in as complete detail as is available the justification of the**
15 **\$650,000 estimate for site preparation for Fire Hall and the \$200,000 for**
16 **Arawana Road.**

17 A2.5.1 The costs for site preparation quoted above are assumed to include the costs required
18 to prepare a suitable level area as required to construct the substation, including
19 retaining walls if required. The anticipated work has been estimated based on site
20 visits and a visual determination of the particular challenges each site presents.
21 Preliminary survey work permits FortisBC to develop estimated quantities of cut/fill,
22 as well as flag any potential topography issues.

23
24 Site preparation cost estimates are preliminary in nature due to the number of
25 unknown variables that are present (i.e. unknown subsurface conditions, etc.) and are
26 subject to change depending on actual conditions and final site placement.

27
28 For each site, FortisBC has assumed approximately \$200,000 will be required to
29 prepare a suitable level area to construct the substation. The \$200,000 is assumed to
30 provide sufficient funds to excavate, import, fill, store, construct suitable access, and

1 provide restoration areas affected by construction. In addition to this amount the Fire
2 Hall site presents some other challenges as follows:

- 3 ▪ The Fire Hall site has a small footprint that does not allow for stockpiling
4 materials on site. For this reason, site preparation costs are higher as all material
5 excavated must be removed from site and disposed of. The additional cost to haul
6 and dispose of this material is estimated to be \$55,000.
- 7 ▪ The Fire Hall site has a small footprint that restricts construction traffic and
8 requires full time traffic control during site preparation. An allowance of \$50,000
9 has been included for traffic control throughout the duration of the project.
- 10 ▪ The Fire Hall site has a small footprint that reduces the amount of equipment that
11 can be working on the site at any time, thereby increasing the time required to
12 complete civil construction. The cost of the additional time required to complete
13 construction at the Fire Hall site is estimated to be \$70,000.
- 14 ▪ A retaining wall will need to be constructed along the north and west sides of the
15 Fire Hall site to build a large enough level area to construct the substation. The
16 estimated cost of the retaining structure is \$175,000.
- 17 ▪ A gas main is located in the center of the Fire Hall property. An allowance of
18 \$100,000 has been made in the estimate to allow for mitigative measures to
19 relocate or adequately ground the gas main if required.

20
21 **Q2.5.2 The RDOS memo at NAFS Appendix A1.20.2, pp.2-3, refers to a water main on**
22 **the Arawana Road site running parallel to the North property line and two**
23 **water connections. It also refers to a water main along the east side of Arawana**
24 **Road. Does preparation of a substation site at the Arawana Road site require**
25 **any work regarding these water lines, or other utilities? If so, how much would**
26 **this work cost, and has it been included in the \$200,000 estimate for site**
27 **preparation for Arawana Road?**

28 A2.5.2 FortisBC is not anticipating any interference with the water main that runs along the
29 north property line. The exact location of the two water services noted in the memo
30 has not been determined, and as such no allowance has been made in the cost estimate
31 for the site preparation at Arawana Road. It should be noted that the cost to

1 decommission a water service is expected to be minimal and would be borne within
2 the total project costs.

3
4 **2.6.0 Reference: Exhibit B-5, NAFS A1.4.12**

5 **Apparently FortisBC misunderstood the request. “Please provide a figure for**
6 **the value of the Arawana Road site calculated according to the area of the site in**
7 **square meters times the deemed undiscounted unit value of the right-of-way**
8 **properties used to determine the value of \$300,000 for “Future Project Costs:**
9 **Transmission Line” Arawana Road.”**

10 **Q2.6.1 In NAFS A1.4.10 (and elsewhere), FortisBC indicates that the proposed right of**
11 **way for the direct transmission and distribution line would be 10 meters wide.**
12 **What is the length of the proposed right of way, and what is the total area of**
13 **proposed right of way?**

14 A2.6.1 The right of way will be approximately 550 meters long, which represents the
15 distance from the subject property to Naramata Road. Therefore the total area of the
16 proposed right of way would be 5,500 square meters.

17
18 **Q2.6.2 At \$300,000 for the proposed right of way, what is the cost of the right of way**
19 **per square meter?**

20 A2.6.2 The cost per square meter is \$54.55 ($\$300,000 \div 5,500$).

21
22 **Q2.6.3 Given that the Arawana Road site is 12,500 square meters, what would be the**
23 **value of the Arawana Road site if it were calculated at the cost per square meter**
24 **of the right of way?**

25 A2.6.3 The value would be approximately \$682,000 ($\$54.55 \times 12,500$).

26
27 **2.7.0 Reference: Exhibit B-5, NAFS A1.5.5**

28 **Asked about expropriation of a transmission line right of way for the ‘direct**
29 **route,’ FortisBC states that it is not proposing to expropriate any property.**

30 **Q2.7.5 Has FortisBC made contact with the owners of land on which easements would**
31 **be required for the transmission line on the Arawana Road route?**

1 A2.7.5 No. FortisBC has not made individual contact with the landowners. The locations at
2 which easements may be required for the transmission line anchoring along Arawana
3 Road will not be known until the line route has been finalized and detailed design
4 work completed to determine the final location of structures and the associated
5 easements required.
6

7 **2.8.0 Reference: Exhibit B-5, NAFS A1.5.9**
8 **Asked about why it believes RDOS rezoning of the Arawana Road site would be**
9 **approved in October 2007 only one month following a September 2007 BCUC**
10 **decision, FortisBC refers to its characterization of the position of the Naramata**
11 **APC and states that “there is nothing to indicate that the [rezoning] Application**
12 **will take any longer than would normally be expected.”**

13 **Q2.8.3 What would be the effect on the respective project in-service dates of the**
14 **Arawana Road option and the Fire Hall option if the RDOS consideration and**
15 **decision regarding rezoning both (a) took at least four months from a September**
16 **BCUC decision and (b) was the same length of time for either the Arawana Road**
17 **site or the Fire Hall site?**

18 A2.8.3 Additional information provided to FortisBC indicates that four months is a more
19 realistic estimate of time to complete the rezoning process. Construction at either site
20 could be completed within the stated timeframes.
21

22 **Q2.8.4 For the scenario described in the preceding question, what would be the**
23 **corresponding effect on the AFUDC and total project cost estimates for the**
24 **Arawana Road option and the Fire Hall option?**

25 A2.8.4 There would be no change to the construction timelines and therefore no change in
26 the AFUDC or total cost estimates.

1 **2.9.0 Reference: Exhibit B-5, NAFS A1.12.1**

2 **Q2.9.1 Please confirm that the right of way for a transmission line on the ‘direct’ route**
3 **is within the Agricultural Land Reserve and is not included within any non-farm**
4 **use permit issued by the Agricultural Land Commission.**

5 A2.9.1 Confirmed.

6

7 **2.10.0 Reference: Exhibit B-5, NAFS A1.12.2**

8 **Q2.10.1 Did FortisBC do any work on the Gibbard site after the August 5, 2005,**
9 **execution of the option to purchase and prior to the July 12, 2006, application**
10 **for registration?**

11 A2.10.1 As stated in response to NAFS IR1 Q 1.58.1, Topographic surveys for site evaluation
12 began May 13, 2005. A legal survey was conducted between June 16 and June 19,
13 2006.

14

15 **2.14.0 Reference: Exhibit B-5, NAFS A1.20.2**

16 **The IR asks for a copy of the rezoning application. What is provided in NAFS**
17 **Appendix 1.20.2 is an RDOS memo concerning the rezoning application.**

18 **Q2.14.1 Please provide a copy of the actual rezoning application.**

19 A2.14.1 The application for rezoning is attached as Appendix A2.14.1.

20

21 **Q2.17.0 Reference: Exhibit B-5, NAFS A1.32.4 and NAFS A1.1.2**

22 **The map referred to shows existing and proposed distribution lines, but does not**
23 **show the centre of the Naramata load.**

24 **Q2.17.1 Please provide a map showing the distribution of the Naramata load.**

25 Please see Appendix A2.17.1 attached showing the existing Naramata load as
26 represented by connected distribution transformers.

1 **2.21.0 Reference: Exhibit B-5, NAFS A1.39.4**

2 **Q2.21.1 Please explain how the setback distance affects use of the subject property. What**
3 **structures or uses are not allowed within the setback distance? Please confirm**
4 **that a fence or wall are not allowed to be within the setback distance. Would the**
5 **setbacks preclude FortisBC from planting grass and shrubs between the fence**
6 **and the road?**

7 A2.21.1 With respect to the Fire Hall site, setback distances as set out by the Ministry of
8 Transportation (“MoT”) are intended to provide a safe clear zone from the edge of the
9 traveled portion of the highway. Under normal circumstances, development of
10 permanent structures is not permitted within these setbacks. A fence or wall suitable
11 to screen the substation would not be permitted within the setback distance as these
12 structures would potentially impede visibility of motorists turning from Debeck Road
13 on to Arawana Road. In addition, the construction of structures within setback
14 distances can potentially affect highway drainage patterns.

15
16 FortisBC has not requested information regarding the placement of shrubs within the
17 setback. There is likely no restriction on planting grass within the setback distance.

18
19 **2.22.0 Reference: Exhibit B-5, NAFS Appendix A1.2.4, pdf p.135, “Distances between**
20 **Residences”; BCUC Appendix A4.1.3; NAFS A1.51.4; Exhibit B-2, Appendix C,**
21 **A2.2 (p.6)**

22 **This overlay shows the Arawana Road site proposed fenced area as a size that**
23 **presumably is the 65 m x 40 m shown in BCUC Appendix A4.1.3. Exhibit B-2,**
24 **Appendix C, A2.2 states that “The area required for proposed [Arawana Road]**
25 **substation is approximately 40 meters by 50 meters including the required**
26 **perimeter safety zone. In NAFS A1.51.4 FortisBC states that the prepared site at**
27 **the proposed Arawana Road site including site sloping would be approximately**
28 **80 meters x 100 meters.**

1 **Q2.22.1 Does the 40 x 65 meter area on the Appendix A4.1.3 plan represent the fenced**
2 **area?**

3 A2.22.1 Yes. Based on preliminary design, the proposed fenced area at the Arawana site is 40
4 meters x 65 meters.

5
6 **Q2.22.2 Is the perimeter safety zone *inside* or *outside* of the fenced area of the substation?**

7 A2.22.2 The 2 meter perimeter safety zone is outside the fenced area of the substation.
8 Exhibit B-2, Appendix C, page 6 at line 14 incorrectly stated that the perimeter safety
9 zone was included in the substation dimensions.

10

11 **Q2.22.3 Please explain why the proposed size of the (fenced?) area of the Arawana Road**
12 **substation seems to have changed from 40 x 50 meters to 40 x 65 meters.**

13 A2.22.3 As stated in response to BCUC A4.1.3 (Exhibit B-5), the proposed fenced area of the
14 Arawana Road site is slightly larger due primarily to the repositioning of the control
15 building to improve vehicle access within the site.

16

17 **Q2.22.4 If 40 x 65 meters is the fenced area of the proposed Arawana Road substation,**
18 **what are the dimensions of the cleared area included required clearance beyond**
19 **the fence?**

20 A2.22.4 As stated in the response to NAFS IR1 Q1.51.4, based on the preliminary design, the
21 area of the site impacted by construction to provide the 45 x 65 meter fenced area is
22 approximately 80 meters x 100 meters.

23

24 **Q2.22.5 With vegetative screening of the proposed Arawana Road site, what distance is**
25 **required between the fence and the vegetative screening?**

26 A2.22.5 It is expected that a minimum distance of 8-10 feet will be required between the
27 station fence and the vegetative screening.

1 **Q2.22.6 Please provide a version of NAFS Appendix A1.2.4 that shows the prepared site,**
2 **the clearance area, and the road access (in addition to the fenced area). Show**
3 **where the vegetative screening would be located.**

4 A2.22.6 Please refer to Exhibit B-5, BCUC IR1 A4.1.3. This drawing illustrates the
5 anticipated top of slope/toe of slope, access road and the prepared site. The location
6 of vegetative screening if required is anticipated to be on the north and west sides of
7 the station.

8
9 **2.23.0 Reference: Exhibit B-5, NAFS A1.42.2**

10 **Q2.23.1 What are the several ways of achieving vehicle access to the transmission line on**
11 **the ‘direct’ route?**

12 A2.23.1 There are several ways of accessing the transmission line on the direct route.
13 FortisBC prefers to work with landowners to use where practical, existing vehicle
14 access points. Access to the line for construction can also be in the form of
15 helicopter, all terrain vehicles and foot access.

16
17 **Q2.23.2 Does FortisBC have legal authority to expropriate the “access agreement”**
18 **between it and the owner of the land burdened by the statutory right of way?**

19 A2.23.2 The statutory right of way, whether obtained by agreement or expropriation, provides
20 the holder the right to use the property for access to the right of way area and access
21 along the right of way.

22
23 **Q2.23.3 Does an expropriated statutory right of way include the right to vehicle access to**
24 **the transmission line?**

25 A2.23.3 Please see the response to Q 2.23.2 above.

26
27 **2.24.0 Reference: Exhibit B-5, NAFS A1.47.2 and A1.47.5**

28 **2.24.1 Please provide the street addresses of all of the properties on which rights of way**
29 **would have to be obtained for the various alignments of the ‘direct’ TL route.**

1 A2.24.1 Please refer to the response NAFS IR1, Q1.47.2. The final determination of the
2 properties affected by the proposed right of way would be dependent on detailed
3 design.

4
5 For example, it may be more beneficial to construct the proposed line along the fence
6 of one property and acquire a right of way on one property as opposed to two.
7 FortisBC will work with the affected landowners to develop the best solution.

8

9 **Q2.24.2 Please provide an explanation of how each potential alignment would affect**
10 **which property.**

11 A2.24.2 The answer to the above question is entirely dependent on the final design, however,
12 the following general statements can be made;

13

- 14 1. The construction of the transmission line can be done in such a way that there is
15 very little impact to the use of the land. For example, holes can be dug by hand
16 and poles can be set by helicopter, etc.
- 17 2. There is no requirement to clear the land along the right of way unless the
18 vegetation exceeds the allowable height under the lines. FortisBC has
19 transmission and distribution lines in other locations that traverse agricultural
20 land, and takes this into consideration when designing the line. Please see photos
21 below of 44 Line (63 kV transmission with distribution underbuild) in the Oliver
22 area.



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3. Access to the line for maintenance purposes would be infrequent. FortisBC's practice is to conduct a visual "drive-by" inspection annually which does not require access to the poles, and a condition assessment on transmission and distribution lines on an eight year cycle beginning in year twenty. If access is required due to an unforeseen incident (i.e. an insulator is broken), the work may be completed by foot access to the structures dependent on the extent of damage and resulting power outage.
4. FortisBC would endeavor to design the line to achieve the lowest possible impact, and once constructed, should present no impediment to the ongoing use of the

1 land for agricultural purposes. There are no indications at this time that any of the
2 agricultural use of any property would be compromised by the construction or
3 ongoing operation of this proposed line.
4

5 **2.25.0 Reference: Exhibit B-5, NAFS A1.48.1**

6 **FortisBC acknowledges that the Fire Hall site will result in less infrastructure to**
7 **connect the substation to the adjacent transmission and distribution lines.**

8 **2.25.1 Please confirm that the Fire Hall site, by resulting in less infrastructure to**
9 **connect the substation to the adjacent transmission and distribution lines, is**
10 **superior in that respect to the Arawana Road site.**

11 A2.25.1 FortisBC confirms that the Fire Hall site requires fewer new transmission and
12 distribution infrastructure than the Arawana Road site.
13

14 **2.26.0 Reference: Exhibit B-5, NAFS A1.54.1**

15 **Q2.26.1 Please provide the requested questionnaires with the personal information**
16 **blacked out, and provide the requested questionnaires in confidence to the**
17 **BCUC.**

18 FortisBC does not intend to make public the individual questionnaires, but will
19 provide them in, confidence, to the BCUC, if directed to do so.
20

21 **2.29.0 Reference: Exhibit B-5, NAFS A1.54.6**

22 **Q2.29.1 Please either withdraw the suggestion that location of the substation at the Fire**
23 **Hall site might interfere with Fire Department communications or provide a**
24 **copy of the third party report to the Commission in confidence.**

25 A2.29.1 In its letter dated February 14, 2007 (Exhibit B-2, Appendix G), FortisBC stated it
26 had “confirmed that all of the technical issues related to constructing the substation at
27 the Fire Hall site can be addressed by modifying the site layout.” For clarification,
28 FortisBC does not believe that locating the substation at the Fire Hall site would
29 interfere with Fire Department communications.

- 1 **2.32.0 Reference: Exhibit B-5, NAFS A1.56.4 and p.58, photo with line of sight**
2 **elevation diagram**
- 3 **Q2.32.1 Please confirm that red tranches in the elevation diagram are areas where the**
4 **surface would not be visible by a line of sight from the point of origin on the left.**
- 5 A2.32.1 The red tranches in the elevation diagram represent approximately the ground surface
6 which is not visible by a line of sight from the origin of two meters off the ground.
7
- 8 **Q2.32.2 For the record, please provide the height off the ground of the point of origin in**
9 **these line of site diagrams.**
- 10 A2.32.2 The point of origin is two meters off the ground.
11
- 12 **Q2.32.3 The elevation of the base of the substation shown in the line of sight diagrams is**
13 **slightly above 501.6 m. The elevation of the base of the substation shown in**
14 **BCUC Appendix A4.1.3 is 505 m. Please reconcile the difference.**
- 15 A2.32.3 The line of sight profiles in NAFS A1.56.4 are showing the current topography with
16 an approximation of the tallest substation structure above the current topography,
17 whereas the base of the substation in BCUC Appendix A4.1.3 shows an approximate
18 elevation based on estimated cut and fill.
19
- 20 **Q2.32.4 Please provide versions of the line of sight diagrams on pages 58, 59, 60, 61 and**
21 **62 using the same scale on the vertical axis as on the horizontal axis.**
- 22 A2.32.4 Both the horizontal and vertical axes are in meters. Due to limitations in the software
23 used in creation of the line of sight diagrams, the scale on the vertical and horizontal
24 axis cannot be set at a fixed value.
25
- 26 **Q2.32.5 Please confirm that the line of sight diagram on p.58 shows that the entire**
27 **substation, from the base upward, would be visible by a direct line of sight from**
28 **the point of origin on Arawana Road.**
- 29 A2.32.5 The entire substation would not be visible.
30

1 **Q2.32.6 Does this change FortisBC's assertion that the substation's visibility would be**
2 **reduced due to the topography of the site?**

3 A2.32.6 This does not change FortisBC's assertion. FortisBC maintains that the topography
4 of the site will assist in shielding the station from view, compared to placing a
5 substation on a level site such as the Fire Hall site.

6

7 **2.33.0 Reference: Exhibit B-5, NAFS A1.56.4 and p.59, photo with line of sight**
8 **elevation diagram**

9 **Q2.33.1 Please confirm that the line of sight diagram on p.59 shows that the entire**
10 **substation, from the base upward, would be visible by a direct line of sight from**
11 **the point of origin on Arawana Road.**

12 A2.33.1 The entire substation would not be visible.

13

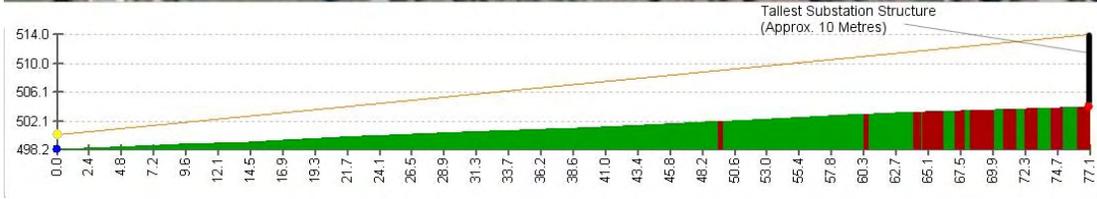
14 **2.34.0 Reference: Exhibit B-5, NAFS A1.56.4 and p.60, photo with line of sight**
15 **elevation diagram from 3018 Debeck Road**

16 **There is a mistake here. The point of origin shown in the photo is not at 3018**
17 **Debeck Road. 3018 Debeck Road is the house immediately to the southwest of**
18 **the house shown.**

19

20 **Q2.34.1 Please provide a line of sight diagram from the side deck on the house at 3018**
21 **Debeck Road.**

22 A2.34.1 The revised line of sight diagram for 3018 Debeck Road is provided below.



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2.35.0 Reference: Exhibit B-5, NAFS A1.56.4 and p.61, photo with line of sight elevation diagram from 3034 Debeck Road

Q2.35.1 What is the height above the base that would be visible by line of sight from the point of origin?

The precise elevation of the substation base is not yet known, pending final design. Please also see the response to Q2.32.3 above.

2.36.0 Reference: Exhibit B-5, NAFS A1.56.4 and p.62, photo with line of sight elevation diagram from 3005 Debeck Road

Q2.36.1 Please confirm that the line of sight diagram on p.59 shows that the entire substation, from the base upward, would be visible by a direct line of sight from the point of origin at 3005 Debeck Road.

A2.36.1 The entire substation would not be visible.

- 1 **2.39.0 Reference: Exhibit B-5, NAFS Appendix A1.20.2, pdf p.145**
2 **The July 25, 2006, RDOS memo states:**
3 **The Naramata Official Community Plan (OCP) Bylaw No 1406, 1993 states that**
4 **one of the objectives of the Regional Board is to designate land for existing and**
5 **future utilities, including local and regional utility systems, as well as to**
6 **encourage efficient layout and minimize local conflicts. OCP policies require**
7 **that adequate distances be incorporated between utility services and other land**
8 **uses through the use of screening and/or building and site design. The OCP also**
9 **encourages utility agencies to hold public meetings on proposed changes to their**
10 **facilities that would affect Naramata.**
- 11 **Q2.39.1 Does FortisBC agree that in terms of the efficient layout of local utility systems**
12 **the Fire Hall site is preferable to the Arawana Road site because the Fire Hall**
13 **site uses the existing transmission line corridor whereas the Arawana Road site**
14 **would require a new transmission line route?**
- 15 A2.39.1 FortisBC confirms that the Fire Hall site requires fewer new transmission and
16 distribution infrastructure than the Arawana Road site, but notes that the Arawana
17 Road site provides for better screening, as stated in the OCP policy cited above.
18
- 19 **2.40.0 Reference: Exhibit B-5, BCUC A2.1**
- 20 **Q2.40.1 Please provide the price per square meter corresponding to a purchase price of**
21 **\$400,000 for the Fire Hall site.**
22 The combined area of the two sites is 2,700 square meters, resulting in a price of
23 approximately \$148 per square meter.
24
- 25 **Q2.40.2 The price of \$400,000 seems high. Please provide a justification.**
- 26 A2.40.2 Preliminary market value is estimated at \$350,000, based on comparable property
27 sales in the area. An additional \$50,000 has been added to that amount for surveying,
28 legal fees, administration and plan registration.
29

- 1 **2.41.0 Reference: Exhibit B-5, BCUC A2.3**
2 **FortisBC provides a list of the major variables that have driven the cost increase**
3 **from \$3.25 million in the 2005 Revenue Requirements Application to the current**
4 **project estimate of \$6.3 million for the Arawana Road site. Sunk Costs are noted**
5 **at \$1,100,000.**
- 6 **Q2.41.1 Please provide a table showing the 2005 RRA budget estimate, the**
7 **corresponding current project estimate figures, and explanatory notes.**
- 8 A2.41.1 FortisBC's response to BCUC IR1 Q2.3 provided information on the major factors
9 influencing the cost differences. The detail requested is not relevant to the decision
10 as to locating the substation.
11
- 12 **Q2.41.2 Please provide a breakdown of the \$1,100,000 in Sunk Costs.**
- 13 A1.41.2 The \$1.1 million includes approximately \$525,000 associated with engineering and
14 preliminary design for numerous sites and potential transmission and distribution
15 routes and options, and a roughly equivalent amount for public consultation,
16 regulatory and other preliminary project management activities. A more appropriate
17 description would be "Preliminary Engineering and Investigation" costs.
18
- 19 **Q2.41.3 What is it about the Sunk Costs that explains the increase in the estimated**
20 **project cost? What work was done or expenditures incurred that were not**
21 **anticipated in the 2005 RRA estimate?**
- 22 A2.41.3 Costs associated with further review of potential sites already determined to be
23 unsuitable, non-standard engineering work to determine the suitability of the Fire Hall
24 site, and the protracted regulatory process are some examples.
25

1 **2.42.0 Reference: Exhibit B-5, BCUC A2.3, “Table 7 – Exhibit B-1, Page 2, C.7**
2 **(Updated Project Costs) as adjusted**

3 **Q2.42.1 Please provide a breakdown of Costs Going Forward, Civil and Site, for**
4 **Arawana Road and for Fire Hall, shown as \$936k and \$1,911k, respectively.**

5 A2.42.1 The breakdown requested is provided below.

Category	Fire Hall	Arawana	Comments
	(\$000s)		
Foundations	170	187	
Site Preparation	650	200	Refer to A2.5.1 above
Grounding	503	352	
Conduit, Trenching	150	75	Additional work required to route underground egress through and around retaining wall
Fencing	20	20	
Misc. (includes security, signage, lighting, etc.)	38	17	
Staging Yard	130	-	Not required at Arawana Road Site
Contingency (15% for site works)	250	85	Contingency on site work 15% at Fire Hall. 10% at Arawana. Contingency assigned represents anticipated risk at each site.
TOTAL	1,911	936	

6
7 **Q2.42.2 Please provide in as complete detail as is available the justification of the**
8 **difference in the two estimates.**

9 A2.42.2 Please see the response to Q2.42.1 above.

1 **Q2.42.3 Please provide a breakdown of Costs Going Forward, Engineering,**
2 **Commissioning and Project Management, for Arawana Road and for Fire Hall,**
3 **shown as \$792k and \$1,023k, respectively.**

4 A2.42.3 The breakdown requested is provided below.

Category	Fire Hall	Arawana	Comments
	(\$000s)		
Project Management	365	276	Includes Project Management costs, Construction Supervision, small Tools and Equipment and Misc.
Engineering	537	387	
Commissioning	121	129	
Total	1,023	972	

5
6 **Q2.42.4 Please provide in as complete detail as is available the justification of the**
7 **difference in the two estimates.**

8 A2.42.4 The Engineering costs at the Fire Hall site will be higher as FortisBC will not be able
9 to utilize standard structures and drawings. In addition, the civil/site restrictions
10 noted previously will require additional effort.

11
12 Project Management costs will be higher at the Fire Hall site due to a longer
13 construction time frame and potentially more challenging construction. The Project
14 management costs include construction supervision costs, which are calculated as a
15 percentage of the overall estimate, therefore it is expected that this category would
16 have a higher cost at the Fire Hall site.

17
18 **Q2.42.5 Please explain Costs Going Forward, Distribution Line, for Arawana Road and**
19 **for Fire Hall, shown as \$100k and \$50k, respectively. What work is required?**
20 **What is the difference between the work to be done in the Arawana Road**
21 **substation scenario and in the Fire Hall substation scenario?**

22 A2.42.5 For the Arawana Road Substation scenario, the value in the table is reflective of the
23 anticipated cost to upgrade the existing distribution line along Arawana Road from
24 Naramata Road to the new substation.

25

1 For the Fire Hall site, \$50,000 has been provided as an allowance to connect the two
2 new feeders from the substation to the existing distribution lines. The actual route
3 will be determined through detailed design, but the estimate allows for the potential
4 that the feeders can be extended a short distance underground to a riser pole as there
5 is likely inadequate space within the Fire Hall site itself to construct riser poles for the
6 new distribution feeders.

7
8 **2.43.0 Reference: Exhibit B-5, BCUC A2.5.6, Project Estimates (p.6)**

9 **2.43.1 The revenue figure of \$500k for Disposal of Arawana Road site seems low**
10 **(columns i and ii). Please provide a justification. Please confirm that the site**
11 **would be a suitable building site.**

12 A2.43.1 The 2007 BC Assessment Authority values this land at \$345,000. Recognizing
13 BCAA figures may be lower than market value, and given that the purchase price was
14 \$407,000 based on a credentialed appraisal, FortisBC's estimate of the value is
15 \$500,000.

16
17 **Q2.43.2 Re column ii and column i, please confirm that "Aesthetic wall" adds \$140k to**
18 **the Fire Hall total estimate. What is the height and length of wall?**

19 A2.43.2 Confirmed. FortisBC has assumed that the aesthetic wall at the Fire Hall site will
20 enclose the four sides of the station at a height of 10 feet. The total distance was
21 assumed to be 140 meters.

22
23 **Q2.43.3 Re column iv and column iii, please confirm that "Vegetation" adds \$150k to the**
24 **Arawana Road total estimate. Is FortisBC proposing Vegetation with the**
25 **Arawana Road site? How much of the \$150k estimate is for the retaining wall?**

26 A2.43.3 Confirmed. FortisBC is not proposing a full vegetation screen at this time, but is
27 showing the estimated cost difference should full vegetation screening be provided.
28 The estimated cost of the retaining wall is \$120,000, with approximately \$30,000
29 being estimated to provide vegetation at the same elevation as the station fence line.

30

1 The project estimate does assume restoration of the cut and fill slopes. To the extent
2 practical, FortisBC will preserve the natural tree buffer that exists along the fence line
3 of Arawana Road. A further possible alternative that FortisBC would consider,
4 providing the costs fall within the approved costs of the Project, would be the use of
5 privacy slats in the fencing around the substation to, again, further reduce visibility.
6

7 **Q2.43.4 Re column v and column iii, please confirm that “Aesthetic wall” adds \$80k to**
8 **the Arawana Road total estimate. What is the height and length of wall?**

9 A2.43.4 Confirmed. FortisBC has assumed that the Aesthetic wall would be installed on the
10 north and west sides of the substation for a total length of approximately 100 meters.
11

12 **Q2.43.5 Re column viii Option D Arawana Road O/H at \$300k and columns iii, iv and v**
13 **Direct O/H at \$250k, the figure for Option D seems low, given the comments**
14 **about difficult angles. Please provide justification. Please provide a figure for**
15 **Option D Transmission Line that has the same level of confidence as the \$250k**
16 **figure for the Direct Transmission Line.**

17 A2.43.5 Both the Arawana Road option and the direct overhead route require approximately
18 the same number of poles. The \$50,000 difference in the estimated cost is the
19 material premium for stronger poles, and the installation of more anchors on the
20 Arawana Road option. In addition, the direct overhead route has some allowances for
21 hand dug holes and helicopter access to address access to the new structure locations
22 which increases the cost of this option over a conventionally built line (i.e. with land
23 access to the structures).
24

25 **Q2.43.6 Re columns i and ii, and columns iii, iv and v, if not already answered above,**
26 **please explain the difference between \$50k Distribution Line for Fire Hall and**
27 **\$100k Distribution Line for Arawana Road (substation site.)**

28 A2.43.6 Please see the response to Q2.42.5 above.
29

30 **Q2.43.7 Re column viii Option D, Distribution Line figure of \$150k with a note “Allows**
31 **for underground distribution feeder.” Does this mean that the estimate for**

1 **putting the same DL underground is only \$50k higher than for putting it above**
2 **ground? The note on pp.7-8 refers to “potential underground interferences with**
3 **existing utilities.” Please provide an estimate with the same level of confidence as**
4 **the estimate for Option C.**

5 A2.43.7 The difference in the comparison above is as follows.

- 6 ▪ For the overhead feeder, it is assumed that all existing services would be
7 transferred to the new feeder. This results in more work and higher construction
8 costs.
- 9 ▪ The estimate for the underground distribution feeder is intended to act as an
10 uninterrupted line from the station to the riser pole on Naramata Road. If services
11 were to be provided from this underground feeder, the estimate would be higher.

12
13 Any conflicts identified during detailed design will be addressed at that time.

14
15 **Q2.43.8 Re column viii Option D, Lines rights of way figure of \$100k with a note “Costs**
16 **estimated are to allow for acquiring anchoring easements where required.” The**
17 **figure of \$100k seems high given an estimate of \$300k for an entire ROW in the**
18 **Direct route. Please justify and/or provide figures with the same level of**
19 **confidence.**

20 A2.43.8 The \$100,000 estimate is provided as an allowance to acquire anchoring easements.
21 The actual cost to acquire these easements is dependent on the outcome of the
22 negotiations with the affected property owners.

23
24 **Q2.43.9 Re column viii Option D (Arawana Road TL and DL O/H with DL U/G) and**
25 **column iii Option C (Direct TL and DL O/H with Arawana Road DL O/H),**
26 **please confirm that Option D is \$100k less expensive.**

27 A2.43.9 The capital cost of Option D is \$100,000 lower than the capital cost of Option C.

1 **2.44.0 Reference: Exhibit B-5, BCUC A3.2**

2 **Q2.44.1 How high is the lighting mast?**

3 A2.44.1 The requirement for a lightning mast is determined during detailed design. If one is
4 required, it would typically be installed on the A-Frame for an additional height of 3
5 meters above the A-Frame height of 9.8 meters. The lightning mast is equivalent to a
6 two inch diameter pipe, therefore visibility of the mast would be extremely low.

7
8 **2.45.0 Reference: Exhibit B-5, BCUC A3.6.4**

9 **Q2.45.1 Please reconcile this statement with the statements elsewhere to the effect that**
10 **the Fire Hall site is feasible albeit smaller than desirable.**

11 A2.45.1 The parcel of land referenced in the response BCUC IR1 Q3.6.4 is not large enough
12 to construct the substation. As stated in Exhibit B-1, paragraphs 11 and 12 at page 3,
13 a second parcel of land would be required to construct the substation.

14
15 **2.46.0 Reference: Exhibit B-5, BCUC A4.1.3**

16 **Q2.46.1 What is the cost of paving the (Fire Hall) substation site to mitigate grounding**
17 **issues? Has this been included in the cost estimate?**

18 A2.46.1 An allowance of \$150,000 has been included in the cost estimate to pave the Fire Hall
19 site.

20
21 **Q2.46.2 Please confirm that the list of operational difficulties at the top of p.15 are**
22 **applicable to a situation when a mobile substation is required to be installed.**

23 **A2.46.2** The list of issues is applicable to times when a mobile substation is required to be
24 installed, as well as times when maintenance is scheduled that is completed under
25 either a planned outage or while the substation is still energized.

26
27 **Q2.46.3 Please confirm that, per BCUC A4.1.6, the mobile substation was last used in**
28 **Naramata in 1996.**

29 A2.45.3 Based on FortisBC's records, the mobile substation was last used in Naramata in
30 1996. It is possible that the mobile substation has been temporarily located at the Fire

- 1 Hall site, either for storage when not in use, or while being moved between other
2 sites.
3
- 4 **2.49.0 Reference: Exhibit B-5, BCUC A6.1 “Artist rendering of substation at Arawana
5 Road site”, p.26**
- 6 **Q2.49.2 Is the location of the substation accurate in this rendition? Compare the location
7 shown in BCUC Appendix A5.2**
- 8 A2.49.2 The artists rendering does not exactly reflect the proposed position of the substation
9 as depicted in BCUC Appendix A5.2.
10
- 11 **2.51.0 Reference: Exhibit B-5, Andrew Appendix A2.1**
- 12 **Q2.51.1 Please confirm that the designed substation at the Fire Hall site meets current
13 standards.**
- 14 A2.51.1 Please refer to the response to BCUC IR1 Q4.1.3.
15
- 16 **2.52.0 Reference: Exhibit B-5, Andrew Appendix A1.3**
- 17 **Q2.52.1 Is the title (“Existing Station Cross-Sections”) incorrect? Should the title be Fire
18 Hall Cross-Sections?**
- 19 A2.52.1 Yes, the title should be Fire Hall Cross-Sections.
20
- 21 **Q2.52.2 Please provide the plan showing the sections (1 to 6).**
- 22 A2.52.2 Please see Appendix 2.52.2 attached. The plan shown in the appendix is marked with
23 arrows numbered 1 through 6 which denotes the approximate location of the sections
24 shown Andrew IR1 A1.3.
25
- 26 **2.53.0 Reference: Exhibit B-5, BCUC Appendix A4.1.3, pdf p., “Arawana Road Site”
27 This plan shows the Arawana Road site proposed layout with the 63 kV
28 transmission line exiting the substation to the south.**
- 29 **Q2.53.1 To which transmission line route option does the layout of the substation
30 equipment correspond?**
- 31 A2.53.1 The substation layout is the same for both transmission route options.

1

2 **Q2.53.2 Would the layout of the substation equipment be different if the Arawana Road**
3 **transmission line route was used? If so, please provide a plan.**

4 A2.53.2 The substation layout would not be different.

Request for a Site-Specific Zone
 To Allow for the Installation of an Electrical Substation
 Lot 13, DL 207, SDYD, Plan 576 (Except Parcel A shown on
 Plan A62 and Parcel B shown on Plan B5981)

2860 Arawana Road, Naramata, BC

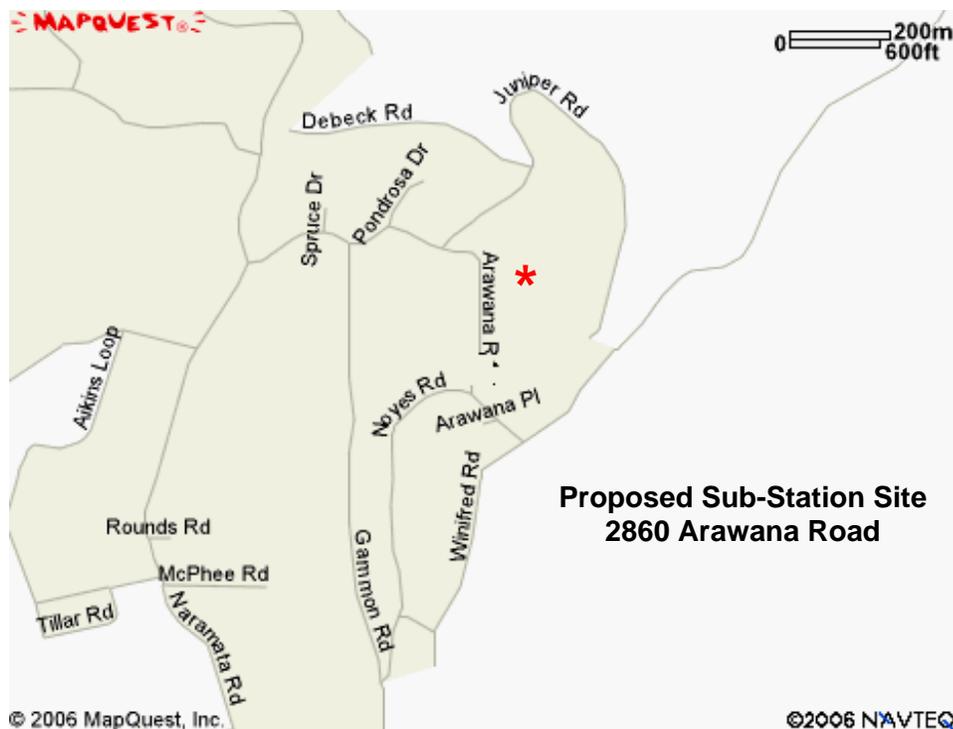
Applicant: Fortis BC

Background

This proposal is for rezoning to accommodate a new electrical distribution sub-station for Fortis BC, the power utility for the Naramata area. The new substation is required due to the failure of the existing station on North Naramata Road to provide adequate and reliable power to the farms and homes on the east side of Okanagan Lake. Significant power supply issues are most prevalent during the spring irrigation season, when the agricultural industry places the greatest demand on water pumping, and during the winter season when peak demands result from Naramata residents. The graph attached as Appendix A demonstrates the load forecast and subsequent need for the new station originally scheduled for construction in 2005.

Siting Rationale

The property under this application for a Site Specific Zone is an 8.8 ha site located within the Agricultural Land Reserve on Arawana Road. The land is limited by rockiness and is not currently in agricultural production. An aerial site plan of the property and surrounding area is provided as Appendix B.



The Agricultural Land Commission has given approval for the non-farm use of a 1.25 ha portion of the site for construction of an electrical substation under Resolution #176/2006. See Appendix C for a copy of the ALC Resolution.

Relocation of the existing substation to a new site is critical. Improving service from the present location is not an option as the surrounding property owners are unwilling to provide the additional land required for the upgraded substation.

Noise Levels

Due to the distance between the proposed substation site and neighbouring homes, it is unlikely that any noise associated with the station will be detected. Fortis is willing to reassess the noise levels after the station has been in place for a period of six months. Should residents feel that the noise levels are excessive, steps can be taken to mitigate the problem.

Visual Impact

The substation will occupy approximately 50% of the 1.25 ha with the actual station footprint measuring 40m x 50m. Landscape buffering with drought-tolerant species indigenous to the area will be provided. Fortis is willing to work with neighbourhood residents to determine an effective landscape buffering treatment. Due to the location and slope of the site, the visual impact is expected to be minimal.



Conceptual view of proposed substation site from the west (Debeck Road)



Conceptual view of distribution lines looking northeast from the intersection of Arawana and Debeck Roads



Conceptual view of distribution lines looking eastward from Arawana Road

Lighting around the substation will be directional rather than broad and will be triggered only by entry to the station in the case of maintenance and repairs.

Routing options for the transmission lines are still being investigated and Fortis will make every effort to minimize the visual impact of these lines.

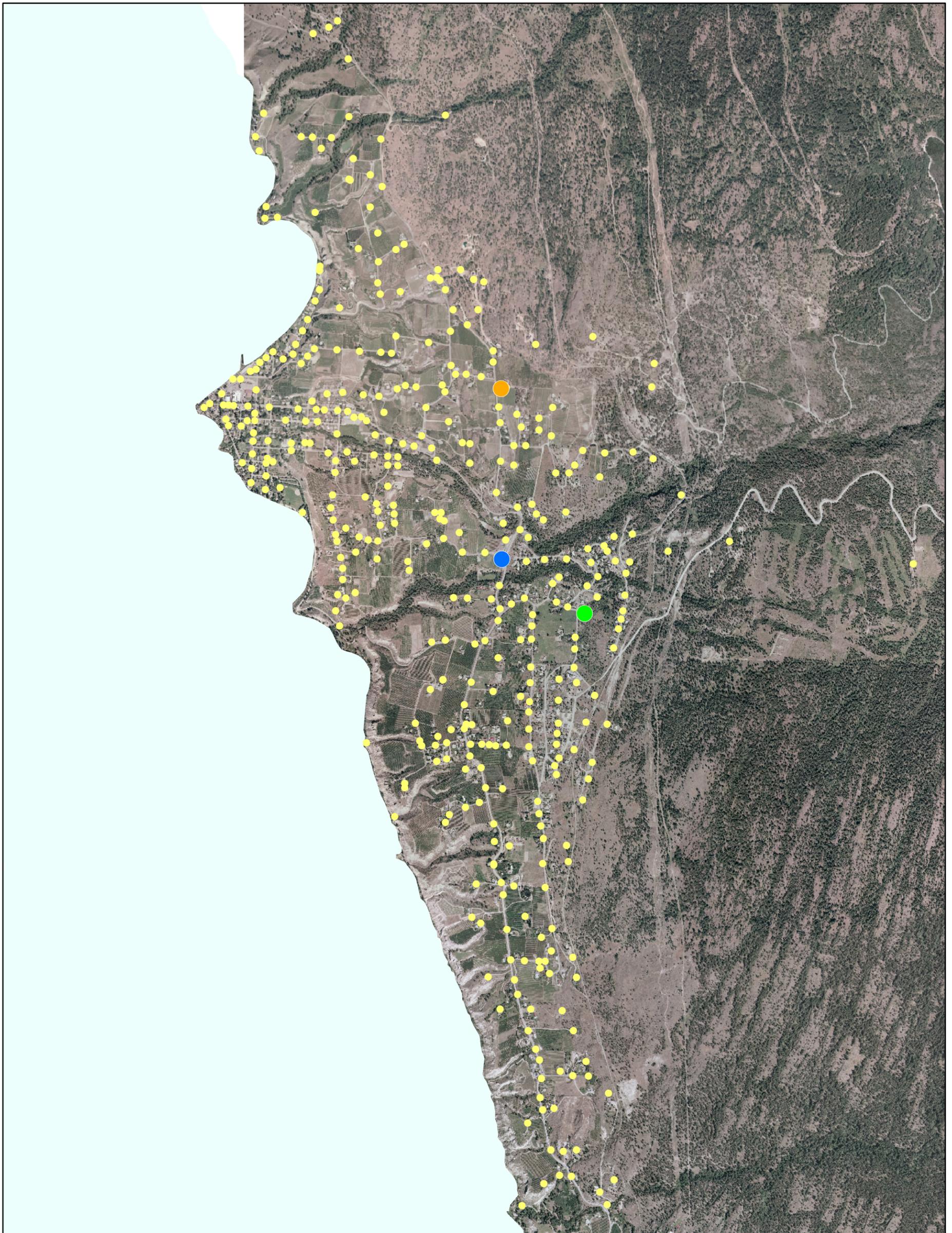
Summary

The community of Naramata is in urgent need of a new electrical substation to avoid interruptions in power supply. An extensive review of available lands has led Fortis, along with the Agricultural Land Commission, to determine that the Arawana site is most suitable for this use. Impacts to the surrounding neighbourhoods will be minimal and Fortis is willing to continue to work with residents to achieve a balance between utility needs and aesthetic desires within this rural setting.

Naramata Distribution of Load



AM/FM GIS Data Integrity Section
1290 Esplanade, Box 130, Trail BC V1R 4L4
<http://www.fortisbc.com>

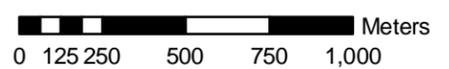


Legend

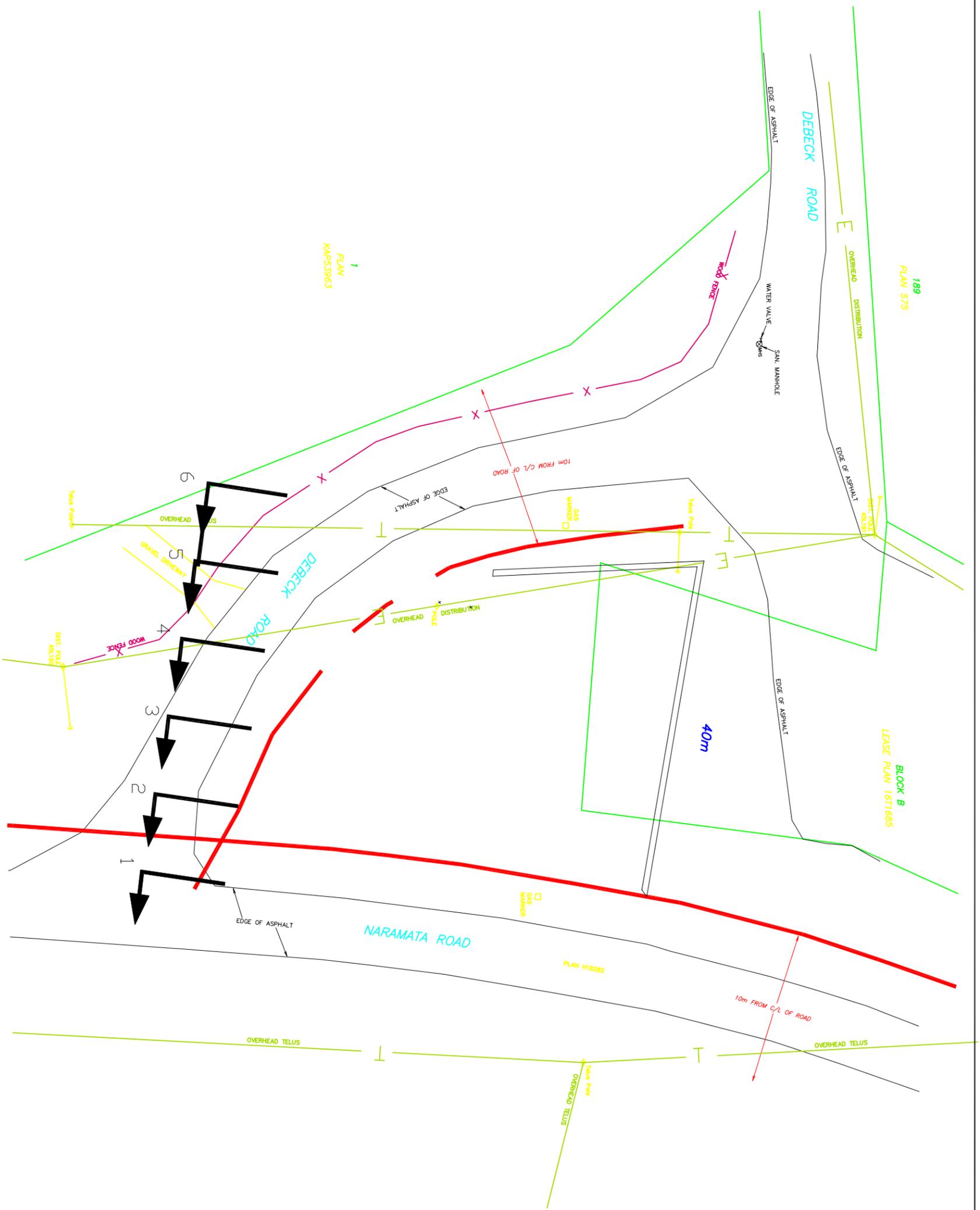
- Primary Transformer
- Arawana Proposed Site
- Firehall Proposed Site
- Existing Naramata Substation Site



Produced July 13, 2007



Data has been developed using the most current available information, but errors or omissions may exist. Please forward any questions or omissions to the FortisBC AM/FM GIS Data Integrity Section.



REV	DATE	BY	CHECKED	DESCRIPTION	REVISION APPROVAL	DATE	ELEC	CIVIL	MANAGEMENT
4									
3									
2									
1									

DESIGNED BY:	L. SANJILDO	SEP/06
CHECKED BY:		
APPROVALS:		
DIVISION:	OKANAGAN	
DEPARTMENT:	TRANSMISSION-DISTRIBUTION	
LOCATION:	PROPOSED FIREHALL SITE	
TITLE:	EXISTING STATION CROSS-SECTIONS 1 OF SHEET 1	
SCALE:	None	SCALE FACTOR: 1
DRAWING NUMBER:	3-330-XXXX	REVISION:
		0

1 **Reference: Andrew Information Request No. 1**

2

3 **Q4.5 Re contouring of the direct route option to allow pole placement**

4 **Please answer. How will the line bucket trucks access the ROW when there is such a**
5 **grade level difference between the two roads and the private land?**

6 A4.5 It is FortisBC's practice to work with landowners to determine access, and to use, where
7 practical, existing vehicle access points. If vehicular access is not possible or practical,
8 lines are constructed by hand with the aid of helicopters. Ongoing maintenance activities
9 typically commence when the infrastructure is 20 years old and occurs on an eight year
10 cycle thereafter. This maintenance typically involves an inspection of the power poles
11 and associated hardware. It is preferable to perform this work and any associated
12 maintenance with the use of a bucket truck, however if vehicle access is not feasible, the
13 work can be completed without the use of a truck.

14

15 **Q4.6 Does FortisBC consider cutting down 80 foot high Ponderosa pine trees as**
16 **brushing? Please use 80ft pines in your answer.**

17 A4.6 FortisBC has a brushing program designed to maintain a tree free zone around circuits to
18 address public safety and reliability concerns. As tree branches grow they are trimmed
19 back to maintain a radial clearance zone around the electrical conductor. This typically
20 happens every 2-4 years dependent on the tree type and climatic conditions. Unhealthy
21 trees that are seen to pose a threat of falling into the line are cut and removed. In this
22 case the impact on the "80 foot high Ponderosa pine trees" is unknown at this time and
23 dependent on the final line routing and line design which will be developed with input
24 from the landowners.

25

1 **Reference: Andrew, Thompson, Wright Information Request No 1**

2

3 **Q19 How wide of a right-of-way does FortisBC want on EACH of the agricultural**
4 **properties, Andrew, Thompson, and Wright?**

5 A19 The total estimated width of the right of way is 10 meters. The amount of right of way
6 required from each property owner is dependent on the final alignment determined
7 through detailed design.

8

9 **Q20 Give the law that states that FortisBC has a legal right to operate outside of a**
10 **designated right-of-way on private land adjacent to said right-of-way.**

11 A20 FortisBC's rights in regard to rights of way on private land are found within the language
12 of the specific Right of Way Agreement.